



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,116	12/15/2003	Stephane Dedicu	1244.43343X00	4853
20457 7590 09/20/2007 ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-3873			EXAMINER KURR, JASON RICHARD	
			ART UNIT 2615	PAPER NUMBER
			MAIL DATE 09/20/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/734,116

Applicant(s)

DEDIEU ET AL.

Examiner

Jason R. Kurr

Art Unit

2615

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                                                        |                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                            | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/10/04 4/13/04</u> | 6) <input type="checkbox"/> Other: _____                                                |

## **DETAILED ACTION**

### ***Claim Objections***

Claim 2 is objected to because of the following informalities:

Claim 2 currently depends upon itself. For purposes of examination it will be regarded as if it depends upon claim 1.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-8,10 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Stinson et al (US 7,068,801 B1).

With respect to claim 1, Stinson discloses a method of extending the frequency range of a microphone array embedded in a diffracting object (fig.4,5) beyond a microphone spacing limitation of  $\lambda/2$ , where  $\lambda$  = acoustic wavelength, comprising: configuring said diffracting object to obtain a desired high frequency directivity response at predetermined microphone positions on said diffracting object

Art Unit: 2615

(col.2 ln.48-60); providing a low frequency beamformer operable at said predetermined microphone positions to achieve a desired low frequency directivity response (col.4 ln.15-45); and applying linear constraints to said beamformer for providing a smooth transition between said low and high frequency directivity responses (col.4 ln.38-41).

With respect to claim 2, Stinson discloses the method of claim 1, comprising applying a thin layer of acoustic absorbent material to the surface of said diffracting object to absorb sound at high frequencies (col.13 ln.40-58).

With respect to claim 3, Stinson discloses the method of claim 2, wherein said acoustic absorbent material is applied between respective ones of said microphones (fig.31).

With respect to claim 4, Stinson discloses the method of claim 3, wherein said acoustic absorbent material is applied to a thickness of about  $\lambda/4$  or higher to trap sound waves of wavelength  $\lambda$ . Stinson does not specify the thickness of the disclosed absorbent material, however the present claim fails to teach a value or range of values for the wavelength  $\lambda$  therefor any thickness of the absorbent material of Stinson may satisfy the above limitation of  $\lambda/4$  or higher.

With respect to claim 5, Stinson discloses a conferencing unit, comprising: an array of microphones embedded in a diffracting object (fig.4,5) configured to provide a desired high frequency directivity response at predetermined microphone positions on said diffracting object (col.2 ln.48-60); and a low frequency beamformer operable at said predetermined microphone positions to achieve a desired low frequency directivity

response, wherein said beamformer is linearly constrained to provide a smooth transition between said low and high frequency directivity responses (col.4 ln.15-45).

With respect to claim 6, Stinson discloses the conferencing unit of claim 5, further including a thin layer of acoustic absorbent material applied to the surface of said diffracting object to absorb sound at high frequencies (col.13 ln.40-58).

With respect to claim 7, Stinson discloses the conferencing unit of claim 6, wherein said acoustic absorbent material is applied between respective ones of said microphones (fig.31).

With respect to claim 8, Stinson discloses the conferencing unit of claim 7, wherein said acoustic absorbent material is applied to a thickness of about  $\lambda/4$  or higher to trap sound waves of wavelength  $\lambda$ . Stinson does not specify the thickness of the disclosed absorbent material, however the present claim fails to teach a value or range of values for the wavelength  $\lambda$  therefor any thickness of the absorbent material of Stinson may satisfy the above limitation of  $\lambda/4$  or higher.

With respect to claim 10, Stinson discloses the conferencing unit of claim 5, wherein said beamformer is linearly constrained using two symmetrical look directions  $d\theta-\alpha$  and  $d\theta+\alpha$  with a gain constraint less than one where the spacing  $\theta-\alpha$  and  $\theta+\alpha$  is controlled by  $\alpha$  which increases with frequency (col.8 ln.20-45).

With respect to claim 12, Stinson discloses a method of extending the frequency range of a wave sensor array embedded in a diffracting object (fig.4,5) beyond a inter sensor spacing limitation of  $\lambda/2$ , where  $\lambda$  = acoustic wavelength, comprising: configuring said diffracting object to obtain a desired high frequency

Art Unit: 2615

directivity response at predetermined sensor positions on said diffracting object (col.2 ln.48-60); providing a low frequency beamformer operable at said predetermined sensor positions to achieve a desired low frequency directivity response; and applying linear constraints to said beamformer for providing a smooth transition between said low and high frequency directivity responses (col.4 ln.15-45).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stinson et al (US 7,068,801 B1) in view of Turnbull et al (US 6,681,023 B1).

With respect to claim 9 Stinson discloses the conferencing unit of claim 6, however does not disclose expressly wherein said acoustic absorbent material is one of either open cell foam or felt.

Turnbull discloses the use of open cell foam as an acoustic absorbent material in the structure of a microphone (col.10 ln.15-34).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the foam of Turnbull as the acoustic absorbent material in the invention of Stinson.

The motivation for doing so would have been to use a readily available material that is both inexpensive and abundant.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stinson et al (US 7,068,801 B1).

With respect to claim 11, Stinson discloses the conferencing unit of claim 10, however does not disclose expressly wherein said gain constraint is approximately 0.707.

Official Notice is taken that it is well known in the art to calculate functions with respect to the Root Mean Square (RMS) of a fluctuating variable with respect to time. In the present case it would have been obvious to a person of ordinary skill in the art to calculate the gain constraints of the look function of Stinson with respect to the RMS value (.707) of the peak of the received acoustic signal (where gain = 1). The motivation for doing so would have been to account for a varying wave with respect to time, wherein a peak of the wave does not constantly occur, such as an AC signal.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kuhn (US 5,592,441) discloses a high-gain directional transducer array.

Art Unit: 2615


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason R. Kurr whose telephone number is (571) 272-0552. The examiner can normally be reached on M-F 10:00am to 6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571) 273-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JK

JK

  
VIVIAN CHIN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2300